

ON REAL AND ABSTRACTED GEOMETRIES OF BOREAL FOREST PLANTS

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In Finland, Olkiluoto Island on the western coast has been selected as a repository site for spent nuclear fuel disposal. With approaching licensing steps (application for nuclear construction licence in 2012), the biosphere assessment demonstrating the long-term safety of the repository is developed into more and more site specific. One of the safety criteria is to demonstrate that typical doses to flora and fauna remain, with high confidence, smaller than those that could, based on best available scientific expertise, lead to any detrimental effects. Based on earlier test case and assessment results, and on an international BIOPROTA study on the knowledge quality in applying the international approach to protection of biota in the context of geological nuclear waste repositories, the expected dose rates to the biota are in most cases small and variations within the size of the assumed geometry contribute little to the overall uncertainty. However, in the context of providing site-specific input data to the assessment, and on the other hand at the same time aiming at conceptual integrity, defining appropriate dimensions for the ellipsoids representing plants is in most cases difficult as the shape and structure of the plants deviate from an ellipsoid - unlike the case with most animal species. In this contribution, real shapes and respective ellipsoids as defined in the assessment methodology are compared based on series of measurements at and near the Olkiluoto repository site. From the comparison, conclusions are drawn on the needed interpretation process and on the potential of using alternative geometries for the boreal forest plants included in the study.